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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/901,722	07/11/2001	Akihiro Hikichi	03327.2259	7732

22852 7590 10/08/2003

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EXAMINER

TORRES VELAZQUEZ, NORCA LIZ

ART UNIT PAPER NUMBER

1771

DATE MAILED: 10/08/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

# Office Action Summary

Application No.

09/901,722

Applicant(s)

HIKICHI ET AL.

Examiner

Norca L. Torres-Velazquez

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

## Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☒ Responsive to communication(s) filed on 04 June 2003.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 1-5 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-5 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

## Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

## Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) \_\_\_\_\_.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other:

## **DETAILED ACTION**

### ***Response to Arguments***

1. Applicant's arguments filed June 04, 2003 have been fully considered but they are not persuasive.

a. Applicants argue that the Covaleski and Kolesov & Arai references are not from analogous art because Covaleski deals with brake material; whereas Kolesov & Arai are in the art of oil drilling equipment, that deals with minimizing friction materials as it "reduce[s] friction between drilling column and walls of [a] well...".

Applicants arguments have been considered, however, the Examiner maintains her position that these reference are analogous art because they are directed to friction materials and it is recognized in this art that the effect of friction materials in the final product they are used is dependent on the operational coefficients of friction that these products have, i.e. The products are all basically the same with only friction modifiers being different. Therefore, the final product or use for the friction material will define the coefficient of friction that is needed, and the coefficient of friction is dependent on the composition or concentration of materials used. This holding of the Examiner is based in the knowledge of one skilled in the art, for example, the BORTZ (US 5,646,076) reference provided herein, teaches friction materials and how by maximizing or minimizing the coefficients of friction, the relative movement between friction surfaces is maximized or minimized. (Refer to Column 1, lines 16-44)

b. Further, Applicants argue that Covaleski explicitly teaches away from combining the invention with that of Kolesov because Covaleski teaches that "glass, as the active

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friction ingredient of a friction element, is too 'aggressive' for most commercial applications, the aggressiveness being manifested during use by noise, vibration and/or erratic friction effects when the friction element is engaged with a mating surface." Covaleski at col. 1, ll. 52-57.

It is noted that Covaleski also teaches that to overcome this shortcoming, the patent teaches the inclusion of infusible organic fibers such as aramid fibers, which are also used in the Covaleski reference. It is the Examiner interpretation of Covaleski's teachings on Col. 1, ll. 52-57 that it does not preclude the inclusion or use of glass, but that these are to be used with aramid fibers in order to solve the problem of noise, vibration and/or erratic friction effects when the friction element is engaged with a mating surface.

c. The rejection of claims 1-5 under 35 U.S.C. 112, second paragraph, has been withdrawn in view of Applicant's amendment.

d. Claims 1-5 remain rejected over Covaleski in view of Kolesov, and over Covaleski in view of Arai, as stated below.

***Claim Rejections - 35 USC § 103***

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

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3. Claims 1-5 are rejected under 35 U.S.C. 103(a) as being unpatentable over COVALESKI (US 4,320,823) in view of KOLESOV et al. (SU 1740396 A1) as stated in previous action.

COVALESKI discloses a friction member of improved resistance to wear comprising aramid fibers impregnated with and bonded together by means of a heat-curable cement [which equates to the claimed binder], containing a vulcanizable, rubber which may be carboxylated, a water-soluble, one-step phenolic-type resin and friction modifiers. (Abstract) The reference teaches the use of a heat-curable cement system applied to the aramid fibers [equates to the claimed fibrous reinforcement] with a concentration of about 20 to about 80 percent friction modifiers. It further teaches the use of carbon black, graphite, metal oxides, metallic powders, barytes, clay, silica, alumina, cryolite, litharge and the like as friction modifiers and further the use of known organic fillers such as finely divided polymerized cashew nut oil. (Column 6, lines 15-38).

However, the reference does not disclose the concentration of the friction material components.

KOLESOV et al. discloses a solution for drilling gas and oil wells that contains ellipsoidal glass beads as additive reducing friction between walls of well and casing string.

The reference mixes the drilling solution with ellipsoidal glass beads that are chemically inert and have a chemical composition (in wt%): SiO<sub>2</sub> 61-61.5, CaO 18-18.5, Al<sub>2</sub>O<sub>3</sub> 4.6-4.9, Na<sub>2</sub>O 13.5-14, MgO 0.3-0.4, B<sub>2</sub>O<sub>3</sub> 1.1-1.4 and K<sub>2</sub>O 1.5-2.0. While the reference teaches that the beads are chemically inert and non-soluble in water and hydrocarbons, since these contain the same components as claimed herein, these are considered soluble as defined by Applicant.

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Therefore, the Examiner equates the chemical composition above to the claimed amorphous substance.

Regarding claims 4 and 5, KOLESOV et al. teaches that the optimal shape and amount of glass beads have been found using empirical expressions, based on physical parameters of materials and working characteristics of well. The proposed ellipsoidal beads have higher mechanical resistance than spherically-shaped beads. The stress and load are reduced by 65% compared to those for spherical particles, and the contact area is increased by 4-5 times. (Abstract) Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to use fibers with diameters in a range of from 2  $\mu\text{m}$  to 9  $\mu\text{m}$  and average fiber length in a range from 100  $\mu\text{m}$  to 1,500  $\mu\text{m}$ , since it has been held that discovering an optimum value of a result effective variable involves only routine skill in the art. *In re Boesch*, 617 F.2d 272, 205 USPQ 215 (CCPA 1980).

Since both COVALESKI and KOLESOV et al. are from the same field of endeavor, friction materials, the purpose disclosed by KOLESOV would have been recognized in the pertinent art of COVALESKI.

It would have been obvious at the time the invention was made to a person having ordinary skill in the art to modify the friction material of COVALESKI and provide it with chemically inert beads of the composition disclosed by KOLESOV et al. with the motivation of reducing the consumption of additive as disclosed by KOLESOV et al. (Abstract)

4. Claims 1 and 3-5 are rejected under 35 U.S.C. 103(a) as being unpatentable over ARAI (US 6,260,674 B1) in view of KOLESOV et al. (SU 1740396 A1).

ARAI discloses a friction material that contains a fibrous reinforcement, a binder, and a friction modifier. (Abstract) The reference teaches the use of heat-resistant organic fibers such as aromatic polyamide fibers, and flame-resistant acrylic fibers. It also teaches the use of inorganic fillers of metal particles such as copper, aluminum, zinc; particles of barium sulfate, calcium carbonate, and further teaches the use of synthetic rubber and cashew resin. ARAI teaches the use of phenol resin as a thermosetting resin binder. It also discloses the use of friction modifier including metal oxides such as alumina, magnesia, zirconia, chrome oxide, quartz.

However, the reference does not disclose the concentration of the friction material components.

KOLESOV et al. discloses a solution for drilling gas and oil wells that contains ellipsoidal glass beads as additive reducing friction between walls of well and casing string.

The reference mixes the drilling solution with ellipsoidal glass beads that are chemically inert and have a chemical composition (in wt%):  $\text{SiO}_2$  61-61.5,  $\text{CaO}$  18-18.5,  $\text{Al}_2\text{O}_3$  4.6-4.9,  $\text{Na}_2\text{O}$  13.5-14,  $\text{MgO}$  0.3-0.4,  $\text{B}_2\text{O}_3$  1.1-1.4 and  $\text{K}_2\text{O}$  1.5-2.0. While the reference teaches that the beads are chemically inert and non-soluble in water and hydrocarbons, since these contain the same components as claimed herein, these are considered soluble as defined by Applicant.

Regarding claims 4 and 5, KOLESOV et al. teaches that the optimal shape and amount of glass beads have been found using empirical expressions, based on physical parameters of materials and working characteristics of well. The proposed ellipsoidal beads have higher mechanical resistance than spherically-shaped beads. The stress and load are reduced by 65% compared to those for spherical particles, and the contact area is increased by 4-5 times.

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(Abstract) Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to use fibers with diameters in a range of from 2  $\mu\text{m}$  to 9  $\mu\text{m}$  and average fiber length in a range from 100  $\mu\text{m}$  to 1,500  $\mu\text{m}$ , since it has been held that discovering an optimum value of a result effective variable involves only routine skill in the art. *In re Boesch*, 617 F.2d 272, 205 USPQ 215 (CCPA 1980).

Since both ARAI and KOLESOV et al. are from the same field of endeavor, friction materials, the purpose disclosed by KOLESOV would have been recognized in the pertinent art of ARAI.

It would have been obvious at the time the invention was made to a person having ordinary skill in the art to modify the friction material of ARAI and provide it with chemically inert beads of the composition disclosed by KOLESOV et al. with the motivation of reducing the consumption of additive as disclosed by KOLESOV et al. (Abstract)

2. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.



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Any inquiry concerning this communication or earlier communications from the examiner should be directed to Norca L. Torres-Velazquez whose telephone number is 703-306-5714. The examiner can normally be reached on Monday-Thursday 8:00-4:00 pm..

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Terrel Morris can be reached on 703-308-2414. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0661.

NLT

September 26, 2003

  
TERREL MORRIS  
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